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ABSTRACT

The purpose of this study was to evaluate the quality of experimental research in counseling and counselor education published from 1976 through 1984. The focus of the study was the methodology and reporting of the research rather than its relevance. Time was the independent variable of interest and three 3-year spans were chosen for examination: 1976-78, 1979-81, and 1982-84. Thirty experimental studies were randomly selected from research published in three leading journals in counseling and counselor education during each of the three time periods. These 90 studies were evaluated using a rating scale developed in previous research, the Evaluation Instrument for Experimental Methodology (EIEM). The raters were not aware of the journal in which the article was published, the year of publication, or the author(s) of the article. Unlike the previous research, a significant linear trend was not found over the years 1976 through 1984. Subsequent investigators are encouraged to consider the following factors: (1) overlap of time and the rating of specific articles; (2) investigation across more time periods; (3) closer examination of EIEM for modifications; and (4) drawing sample articles from a larger number of journals. A 23-item reference list, the EIEM scale, a bibliography containing the 90 studies, and the evaluation instrument for experimental methodology are included. (JAZ)

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AN EVALUATION OF EXPERIMENTAL METHODOLOGY IN COUNSELING AND COUNSELOR EDUCATION RESEARCH

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General dissatisfaction has been expressed among professionals in counseling with the scientific bases of our psychological specialty (Harmon, 1982). Many have criticized the research methodologies used (e.g., Gelso, 1980; Goldman, 1976; Harmon, 1982; and Serlin & Lapsley, 1985), while others have focused upon the lack of skill in using the traditional methodologies (e.g., Thoresen, 1980; Wachtel, 1980). How good or bad is the research in counseling and counselor education? Ripstra (1974) in an evaluative study of published research in this field from 1962 to 1973 characterized the methodology as "barely adequate." A more positive result of her study was the identification of a trend in methodological improvement across the years studied.

The Ripstra (1974) study looked at five aspects of experimental studies and thus enlarged upon the findings of an earlier investigation that focused only upon the designs used in empirical studies published during the 1964-68 time period (Kelley, Smits, Leventhal, & Rhodes, 1970). In examining the quality of research across years, Ripstra was addressing the speculation of several authors that the quality of research is improving across time (Carkhuff, 1965; Myers, 1966; Patterson, 1963).

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The study reported here evaluated a sample of the published research in counseling and counselor education from 1976 through 1984 to learn whether or not the trend in improved methodology found by Ripstra (1974) continued through the nine-year period following her study.

Method

Sample

The population of interest was group experimental studies published from 1976 through 1984 in the three major counseling and counselor education journals: Journal of Counseling Psychology, Counselor Education and Supervision, and Journal of Counseling and Development (formerly Personnel and Guidance Journal). As in Ripstra's study, the term "experimental study" was operationally defined as a study in which at least one variable was manipulated and the effects on another variable were observed (Campbell & Stanley, 1963). Studies included were those described by Campbell and Stanley (1963) as having true experimental, pre-experimental, and quasi-experimental designs.

All articles in the three journals of interest were reviewed by a graduate student trained to distinguish among various experimental and non-experimental research designs. Those identified as "experimental" were assigned an identifying number. Of the 1945 studies published in the three journals during the nine-year time period, 316 were identified as being experimental in nature. Of these, 259 were published by the Journal of Counseling Psychology, 39 by Counselor Education and Supervision, and 18 by the Journal of Counseling and Development. From this pool 30 studies were randomly selected from those published during each

time period. This sample size was selected in order to approximate the procedure employed in the Ripstra (1974) study. The 90 studies used in this investigation are listed in Appendix A.

Next, all identifying information was removed, including name of journal, year of publication, name of author, and any information about institutional affiliation and/or grant(s) that supported the research.

Instrument

Assessment of the studies was made through the use of the Evaluation Instrument for Experimental Methodology (EIEM) (Appendix B), a rating form developed by Ripstra and used in the previous study. It has 37 Likert-scaled items, each item having six response options. In constructing the instrument special attention was given to the work of Smith, Smith, Scheffers, and Steinmann's (1971) survey of the common errors which occur in psychological studies as well as other guides to the evaluations of research (Borg, 1963; Burck, Cottingham, & Reardon, 1973; Davitz & Davitz, 1967; Farquhar & Krumboltz, 1959; Isaac & Michael, 1971; Roberts, 1969). The instrument is comprised of five sections: reporting, introduction, methods, results, and discussion as well as a total score. Ripstra (1974) reports an interrater reliability for three raters using the instrument of .79 using Hoyt's Analysis of Variance (1941) prior to her study and .78 on fifteen studies evenly distributed throughout the evaluation process.

Procedures

The two raters in the present study were professors in

the field of counseling and counselor education. Both had considerable experience in the use of rating forms and the evaluation of research, but neither had prior experience with the instrument used in the present study. They held a training session after which they independently rated a study and achieved interrater reliability of .84. This was accepted as evidence that further training in the use of EIEM was not immediately needed.

Each was then assigned 45 studies to review, using the EIEM as the criterion instrument and began the process of rating articles independently. The procedure, consistent with that employed in the Ripstra (1974) study, was that intermittently both would independently rate the same study in order to ensure that a reliability of at least .70 was maintained. Hoyt's reliability coefficient for each of the three studies in the order in which they were rated are reported in Table 1. If the reliability for two successive studies fell below .70, retraining would be undertaken before further studies were rated. However, the raters maintained sufficiently high levels of reliability throughout the rating of studies that retraining was not necessary.

Design and Statistical Analysis

The independent variable was the time period within which research in counseling and counselor education was published. The most recent three-year time spans at the time of the study were selected: 1976-78; 1979-81; and 1982-84. Since the Ripstra (1974) study covered the years 1962-1973, no overlap between the two studies exists. The design was a 1 x 3 matrix with an equal number of observations (studies) per cell.

A multivariate analysis of variance using the six scores

derived from parts of the EIEM was used for statistical treatment. An analysis for orthogonal polynomials, linear, and residual trends across the three time spans was performed in order to determine whether or not there had been a trend in the quality of methodology for published counseling research during the time period under investigation.

Results

The mean scores and standard deviations for each of the five subscales and the total for the three time spans are shown in Table 2. The intercorrelation matrix for the scales of the EIEM rating form is displayed in Table 3.

Test of Hypothesis

To test the hypothesis that research methodology and reporting improved across the time spans studied, analyses of orthogonal polynomials, trend analyses, were performed to determine the form of the relationship between the year spans and the six dependent variables. While the means for each subscale and total increased over the three time spans, a multivariate analysis of othogonal polynomials failed to find a significant linear relationship across time ($F=.135$, $df=1$, $p > .05$). An inspection of the means (Table 2) reveals that in every case the mean in the third time period is greater than the corresponding mean in the first time period. These increases in quality of research in the samples evaluated over the three time periods were too small to reach significance in the multivariate analysis. Separate univeriate analysis of othogonal polynomials were done for each of the subscales of the EIEM. The results of these are displayed in Table 4. Only for one subscale, Introduction, was a

significant linear relationship found to exist across the three time periods ($F=3.44$, $df=1.86$, $p < .05$).

A graph of the means of the six dependent measures across the three time periods is presented in Figure 1. Four subscales and the total are closely clustered, while the Methods subscale is distinctly lower. Four scales show an apparent gain across each of the three time periods, while the Introduction subscale shows a sharp gain from the first to the second time period and an apparent decrease on the third as compared to the second.

Observations

In order to better understand the weaknesses in the research published during the time periods included within this study, items for which the mean score was less than 3.51 were identified. This 3.51 criterion is the boundary between a rating of three (barely inadequate) and four (barely adequate), and was used in a similar manner by Ripstra (1974). The means of seven items fell below this criterion: items 3, 4, 5, 16, 18, 19, and 25. Items 3, 4, and 5 are concerned with the quality of reporting and more specifically with the adequacy of identifying the research population, the method of selecting subjects, and the adequacy of descriptive statements concerning the subjects. For the majority of studied examined, these were not adequately reported.

Three items from the Methodology subscale had means that fell below the 3.51 criterion, contributing to the generally low performance of this scale (see Figure 1). Item 16 dealt with reliability and validity data being provided for dependent measures. Raters found this generally to be less than adequately

done. Items 18 and 19 had to do with the identification of a research population and the random selection of the sample from the population. Few studies used subjects randomly sampled from an identified population. Item 25, the final item to fail to achieve a mean score of 3.51, assessed the degree to which researchers presented evidence that the assumptions necessary for the statistical tests used were met.

Discussion

The purpose of this study was to evaluate the quality of experimental research in counseling and counselor education published from 1976 through 1984. The focus of the study was the methodology and reporting of the research rather than its relevance. Time was the independent variable of interest and three three-year spans were chosen for examination: 1976-78, 1979-81, and 1982-84. Thirty experimental studies were randomly selected from research published in three leading journals in counseling and counselor education during each of the three time periods. These 90 studies were evaluated using a rating scale developed in previous research. The raters were blind as to the journal in which the article was published, the year of publication, and the author(s) of the article.

Unlike the research reported by Ripstra (1974) that found a slight linear trend of improvement in research over the years 1962-1974, a significant linear trend was not found over the years 1976 through 1984, the span of this investigation. It should be noted that although both studies used the same evaluative instrument, the EIEM, each covered a different time period and used different raters. No direct comparison of results can

therefore be made. Despite these differences, the average rating given all studies examined by raters in the Ripstra study was identical to the average rating assigned by raters in the current investigation.

In addition to the test of hypothesis, both studies also examined ratings assigned individual items within the EIEM that failed to meet a minimum criterion of acceptance that, in each instance, was arbitrarily set at 3.51. Of the 35 items in the EIEM, three failed to meet this minimum criterion in both studies. These items dealt with descriptive statements about the reliability and validity of dependent measures, random selection of the sample, and consideration of hypothesis testing assumptions. Beyond these common findings, distinct differences were noted. Ripstra found that three of the six items on the Discussion subscale failed to meet the criterion; this study found that all exceeded the criterion. Ripstra found that all nine items on the Reporting subscale exceeded the criterion; this study found that three items failed to meet this standard.

Of the five subscales, the mean ratings across time periods on the Reporting and Introduction subscales were relatively high and the ratings on Method were relatively low in both studies. The principal difference was that the Results and Discussion mean ratings, again across time periods, were approximately the same as the Reporting and Introduction ratings in the present study, while the Ripstra findings were that both Results and Discussion mean ratings were similar to the Methods rating.

Results of the present study may well indicate that more,

not less, attention should be given to the quality of research being published. Subsequent investigators are encouraged to consider four factors that may improve upon the present study. First, some overlap both of time and, if available, the rating of specific articles would increase the likelihood that direct comparison between investigations could be meaningful. The present investigators had no access to the identity of the articles rated by Ripstra. Second, investigation across more time periods and/or across more years may be necessary in order to detect trends. Perhaps sampling two-year time periods with five-year dormant intervals between would be a more efficient approach than sampling from continuous time intervals. Third, although the EIEM seems to be a sound instrument that produces good interrater reliability, closer examination may reveal that specific items need to be added, modified, or deleted. Finally, with the greatly increased number of journals publishing experimental studies in counseling and counselor education, perhaps the sample of articles to be evaluated should be drawn from a much larger number of journals than were used in this study.

Much is written concerning the status of research in counseling. These thought pieces provide a valuable service in providing direction, support, and criticism concerning published research in the field of counseling and counselor education. In addition, however, continued research on counseling research is firmly advocated.

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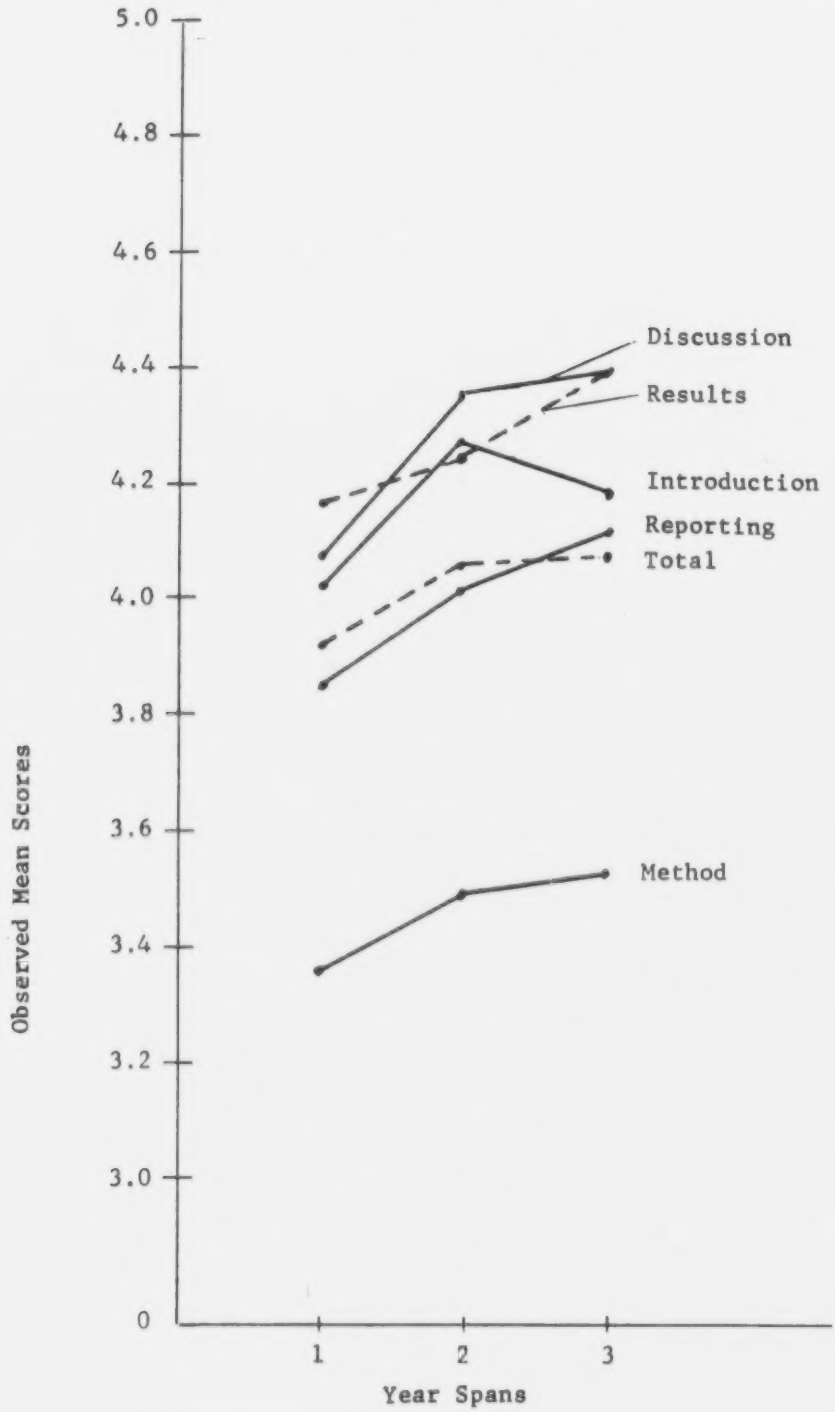

Fig. 1. Observed Means on the Six Measures of the EIEM.

Table 1

Hoyt Reliability Estimates for the Three Commonly Rated Studies in the Order of Rating

Order	Study Number	Reliability
1	62	.83
2	72	.61
3	9	.90

Table 2

Mean Scores and Corrected Standard Deviations for the Scales of the EIEM

	Y_1		Y_2		Y_3		Total	
	Mean	S.D.	Mean	S.D.	Mean	S.D.	Mean	S.D.
Reporting	4.02	.55	4.00	.52	4.14	.54	4.05	.55
Introduction	3.82	.70	4.25	.69	4.18	.68	4.08	.70
Method	3.35	.73	3.47	.84	3.50	.86	3.44	.81
Results	4.17	.86	4.23	.64	4.37	.52	4.25	.69
Discussion	4.13	.71	4.34	.73	4.37	.47	4.28	.65
Total	3.89	.61	4.04	.52	4.09	.54	4.00	.56

Table 3

Sample Intercorrelation Matrix for
Scales of the EIEM

	Rep	Int	Met	Res	Dis	Tot
Reporting	1.00					
Introduction	.63	1.00				
Method	.72	.63	1.00			
Results	.61	.65	.60	1.00		
Discussion	.48	.57	.62	.59	1.00	
Total	.82	.80	.86	.84	.78	1.00

Table 4

Univariate Analysis

Variable	Hypothesis Mean Square	Error Mean Square	F	Sig. of F
Rep	.18717	.30099	.62185	.539
Int	1.60723	.46756	3.43748	.037
Met	.16590	.66102	.25098	.779
Res	.28764	.48077	.59829	.552
Dis	.51569	.42276	1.21981	.300
Tot	.32163	.31223	1.03012	.361

APPENDIX A

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APPENDIX B

Article No. _____

Rater _____

EVALUATION INSTRUMENT FOR EXPERIMENTAL METHODOLOGY

Note: The items are grouped according to convention, but the content of an idividual item may be found anywhere in the study.

Rate each item using the following rating scale:

1	2	3	4	5	6
strongly disagree OR not at all accomplished (absent) OR 90-100% inappropriate	clearly disagree OR clearly inadequate OR 70-89% inappropriate	barely disagree OR barely inadequate OR 51-69% inappropriate	barely agree OR barely adequate OR 51-69% appropriate	clearly agree OR clearly adequate OR 70-89% appropriate	strongly agree OR excellently accomplished OR 90-100% appropriate

REPORTING (attend to the quality of reporting, not to the content of the item)

1. The review of the literature is concise, understandable, and logical. 1 2 3 4 5 6
2. The research hypothesis is clearly stated. 1 2 3 4 5 6
3. The population of interest is clearly specified. 1 2 3 4 5 6
4. The procedure for selection of subjects is clearly specified. 1 2 3 4 5 6
5. The subjects are completely described on relevant variables. 1 2 3 4 5 6
6. The treatment procedures are clearly enough defined to allow for replication. 1 2 3 4 5 6
7. All statistics used in the analysis are named. 1 2 3 4 5 6
8. The results are clearly and concisely reported (no unnecessary data are included). 1 2 3 4 5 6
9. The discussion is understandable and concisely written. 1 2 3 4 5 6

Give an overall rating of the quality of reporting of this study. 1 2 3 4 5 6

INTRODUCTION

10. The purpose of the study is clearly stated. 1 2 3 4 5 6

11. The review of the literature is relevant to the problem and independent variables of interest. 1 2 3 4 5 6

12. Research hypotheses are stated for all variables (if exploratory, this is stated clearly). 1 2 3 4 5 6

13. Each independent variable and its levels are clearly described; the design is clearly enough described to allow you to diagram it. 1 2 3 4 5 6

14. An excellent rationale is given for the use of the particular dependent variables chosen. 1 2 3 4 5 6

METHODS

15. The dependent measures are the most appropriate for the purpose of the study. 1 2 3 4 5 6

16. The reliability and validity data are given for each instrument used as a dependent measure. 1 2 3 4 5 6

17. The interrater reliabilities are given if raters are used. 1 2 3 4 5 6

18. The stated population (not sample) is the relevant one in terms of the nature of the problem and hypotheses. 1 2 3 4 5 6

19. Subjects were randomly selected from the population. 1 2 3 4 5 6

20. Subjects were randomly assigned to treatment groups. 1 2 3 4 5 6

21. Given the data collected by the researcher, the design is such that it provides the maximum precision possible. 1 2 3 4 5 6

22. The design allows for unbiased treatment effects; there are no confounding or uncontrolled irrelevant variables which confuse the results; necessary controls for internal validity are either built into the design or statistically managed. 1 2 3 4 5 6

_____ regression
_____ subject mortality
_____ instrumentation
_____ history
_____ maturation
_____ testing
_____ selection bias
_____ selction-maturation interaction

RESULTS

23.	The best statistical analysis for the design, data, and hypotheses was used.	1 2 3 4 5 6
24.	The data analysis is consistent with the design.	1 2 3 4 5 6
25.	The authors gave evidence that the assumptions necessary for the hypothesis test statistic(s) were met (normality, independence, equality of variance, additivity, etc.).	1 2 3 4 5 6
26.	The unit of analysis is equal to the experimental unit.	1 2 3 4 5 6
27.	Specific answers to the hypotheses are given.	1 2 3 4 5 6
28.	Means and variances or standard deviations are given for each dependent variable according to groups.	1 2 3 4 5 6
29.	The results section includes values of the test statistic, df, and p-value (for ANOVA the MSs are given).	1 2 3 4 5 6

DISCUSSION

30.	The conclusions drawn are consistent with the data results and hypotheses.	1 2 3 4 5 6
31.	The author generalizes to the population, treatments, or settings allowable by the design.	1 2 3 4 5 6
32.	If there were limitations of design, sampling, data collection or data anlysis, the author indicates the qualifications to his study which limit inference.	1 2 3 4 5 6
33.	The author compares his findings to previous research findings or to a theory.	1 2 3 4 5 6
34.	The author makes suggestions for further investigation which logically follow from his study.	1 2 3 4 5 6
35.	The causal inferences made were entirely appropriate according to the design, sampling and analysis.	1 2 3 4 5 6

Make an overall rating of the quality of the methodology of this study (considering items 10 - 35 and not those items in the reporting section). 1 2 3 4 5 6

Comments or any errors which you found not covered in the preceeding items: